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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,486	11/25/2003	Hideki Komatsuda	XE-9366A	4373

181 7590 08/23/2005

MILES & STOCKBRIDGE PC
1751 PINNACLE DRIVE
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MCLEAN, VA 22102-3833

EXAMINER

QUASH, ANTHONY G

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/720,486

Applicant(s)

KOMATSUDA ET AL.

Examiner

Anthony Quash

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,6,8-36 and 39-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/22/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's arguments, see amendment, filed 2/22/05, with respect to the rejection(s) of claim(s) 22, under 112 first paragraph have been fully considered and are persuasive.

Applicant's arguments, see amendment, filed 2/22/05, with respect to the objection(s) of claim(s) 1, 22, 29, 36, 46 have been fully considered and are persuasive.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kudo [JP 06-061121] in view of Hazama [5,191,374]. As per claim 22, Kudo [JP 06-061121] teaches an illumination apparatus for illuminating a surface to be illuminated with a radiation, comprising a radiation source (1), an adjusting optics including a plurality of optical elements (20a-20d), and an optical integrator (5) wherein the adjusting optics controls an inner and/or outer radial extent of an illumination distribution on an illumination pupil, wherein the plurality of optical elements (20a-20d) can be inserted in an illumination optical path, wherein each of the plurality of optical elements defines at least one parameter of the illumination distribution on the illumination pupil. See Kudo [JP 06-061121] abstract, paragraphs [0002, 0007-0016, 0020], and figs. 1-

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3,6-7. However, it does not explicitly state the plurality of optical elements having a first set of optical elements and a second set of optical elements, and wherein one of the first set of optical elements and one of the second set of optical elements are arranged at approximately a same place in the illumination optical path simultaneously. Hazama [5,191,374] does teach the plurality of optical elements having a first set of optical elements and a second set of optical elements, and wherein one of the first set of optical elements and one of the second set of optical elements are arranged at approximately a same place in the illumination optical path simultaneously. See Hazama [5,191,374] col. 15 lines 17-26. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the plurality of optical elements have a first set of optical elements and a second set of optical elements, and wherein one of the first set of optical elements and one of the second set of optical elements are arranged at approximately a same place in the illumination optical path simultaneously, in order provide 36 different transmittances through the combination of the two as taught in Hazama [5,191,374].

As per claim 23, Kudo [JP 06-061121] teaches all aspects of the claim except for explicitly stating that the plurality of optical elements including a refractive element. However, it is the examiner's view that this aspect is inherent in Kudo [JP 06-061121]. The reason for this is because Kudo [JP 06-061121] teaches the optical elements being lens. See Kudo [JP 06-061121] paragraph [0012]. It is well known for lens to have a refractive element.

As per claim 24, Kudo [JP 06-061121] teaches the adjusting optics forming a multipole illumination distribution and/or an annular illumination distribution in the illumination pupil. See Kudo [JP 06-061121] abstract, paragraphs [0002, 0007-0016, 0020], and figs. 1-3,6-7.

As per claim 25, Kudo [JP 06-061121] teaches all aspects of the claim except for explicitly stating that the adjusting optics includes a zoom optical system. It is the examiner's view that this aspect is inherent since Kudo [JP 06-061121] teaches that the optical elements (20a-20d) each have different focal distances, and that the rotation of the holder changes the from 20a to 20d, thereby changing the focal distance. This inherently allows one to change the zoom/magnification. See Kudo [JP 06-061121] abstract, and paragraph [0012].

As per claim 26, Kudo [JP 06-061121] teaches the plurality of optical elements including a plurality of optical surfaces, which are arranged in an array. See Kudo [JP 06-061121] figs. 1-3.

As per claim 27, Kudo [JP 06-061121] teaches a projection exposure apparatus for projecting a pattern on a mask onto a workpiece through a projection optical system comprising, the illumination apparatus which illuminates the mask, wherein the illumination pupil of the illumination apparatus being conjugate with a pupil of the projection optical system. See Kudo [JP 06-061121] abstract, paragraphs [0002, 0007-0016, 0020], and figs. 1-3,6-7.

As per claim 28, Kudo [JP 06-061121] teaches a projection exposure method for projecting a pattern on a mask onto the workpiece through a projection optical system,

comprising illuminating the mask with the illumination apparatus, and projecting the pattern on the mask onto a workpiece. See Kudo [JP 06-061121] abstract, paragraphs [0002, 0007-0016, 0020], and figs. 1-3,6-7.

Allowable Subject Matter

Claims 1-2,5-6,8-21,29-36 and 39-55 remain allowed over the prior art of record.

The following is a statement of reasons for the indication of allowable subject matter: With respect to independent claim 1, and dependent claims 2,5-6, 8-21, are allow because the prior art of record does not disclose nor teach wherein the radiation beam adjustor generates at least a multipole radiation distribution in an illumination pupil, and including a plurality of optical surfaces which are arranged in an array and substantially in a plane, wherein the plurality of optical surfaces deflect a radiation beam from the radiation source to plural directions, wherein one of the deflected radiation beams reaches one of the multipole, and another one of the deflected radiation beams reaches another one of the multipole, and wherein the multipole radiation distribution is continuously varied, in combination with the remaining aspects of claim 1.

With respect to independent claim 29, and dependent claims 30-35, are allow because the prior art of record does not disclose nor teach wherein the adjusting optics controls an inner and/or outer radial extent of an illumination distribution on an illumination pupil, wherein the plurality of optical elements are inserted in an illumination optical path, wherein each of the plurality of optical elements defines at least one

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parameter of the illumination distribution on the illumination pupil, and wherein the adjusting optics excludes an axicon and forms a multipole illumination distribution and/or an annular illumination distribution in the illumination pupil, in combination with the remaining aspects of claim 29.

With respect to independent claim 36, and dependent claims 39-45, are allow because the prior art of record does not disclose nor teach wherein the second member comprises such a number of elements that at least two predetermined illuminations are adjusted by changing the assignment of the plurality of elements of the first member to the plurality of elements of the second member, without having to replace the second member, and wherein the first member with the plurality of elements are exchanged and by replacing the first member it is possible to achieve a different assignment of the plurality of elements of the first member to the plurality of elements of the second member and thereby a different illumination in the illumination pupil, in combination with the remaining aspects of the claim 36.

With respect to independent claim 46, and dependent claims 47-55, are allow because the prior art of record does not disclose nor teach wherein the plurality of elements of the first and the second member are each assigned to radiation channels, and the plurality of elements are configured or arranged such that a continuous beam path from the radiation source to the surface to be illuminated results for each radiation channel, and the second member with the plurality of elements are exchanged and at least one particular illumination in an illumination pupil is achieved with each second member, so that by replacing the second member, a different assignment of the plurality

of elements of the second member is realized, in combination with the remaining aspects of claim 46.

Response to Arguments

Applicant's arguments with respect to claims 22-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 5,264,898 to Kamon et al, 5,712,698 to Poschenrieder et al, 3,854,816 to Fujimura, 5,894,341 to Nishi et al, and 6,002,467 to Nishi et al are considered pertinent to the applicant's disclosure. Kamon [5,264,898] is considered pertinent due to its discussion on a projection exposure apparatus. Poschenrieder [5,712,698] is considered pertinent due to its discussion on independently controllable shutters and variable area apertures for off axis illumination. In addition, it is the examiners view that this reference teaches a first set of optical elements, and a second set of optical element arranged at approximately a sample place in the illumination optical path simultaneously. See Poschenrieder [5,712,698] figs. 4-7. Fujimura [3,854,816] is considered pertinent due to its discussion on a photographic printing apparatus. Both Nishi [5,894,341] and Nishi [6,002,467] are considered pertinent due to their discussion on an exposure apparatus and method for measuring a quantity of light with temperature variations. See Nishi [5,894,341] with respect to elements 14b, and 16.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

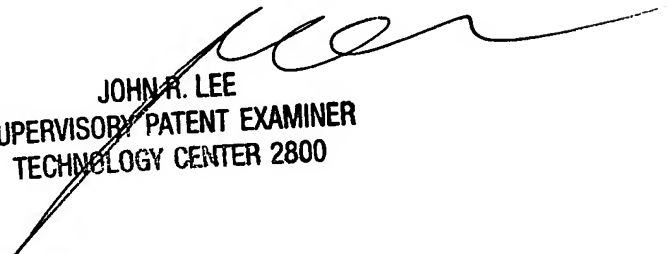
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. Quash

AQ
8/21/05


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